Apple II

Disk II

Installation Manual

DRIVE 1
IN USE
disk II

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▲ **Warning**

This equipment has been certified to comply with the limits for a Class B computing device, pursuant to Subpart J of Part 15 of FCC Rules. Only peripherals (computer input/output devices, terminals, printers, etc.) certified to comply with the Class B limits may be attached to this computer. Operation with non-certified peripherals is likely to result in interference to radio and TV reception.

Radio and Television Interference

The equipment described in this manual generates and uses radio-frequency energy. If it is not installed and used properly, that is, in strict accordance with our instructions, it may cause interference with radio and television reception.

This equipment has been tested and complies with the limits for a Class B computing device in accordance with the specifications in Subpart J, Part 15, of FCC rules. These rules are designed to provide reasonable protection against such interference in a residential installation. However, there is no guarantee that the interference will not occur in a particular installation, especially if you use a "rabbit ear" television antenna. (A "rabbit ear" antenna is the telescoping-rod type usually contained on TV receivers.)

You can determine whether your computer is causing interference by turning it off. If the interference stops, it was probably caused by the computer or its peripheral devices. To further isolate the problem:

- Disconnect the peripheral devices and their input/output cables one at a time. If the interference stops, it is caused by either the peripheral device or its I/O cable. These devices usually require shielded I/O cables. For Apple peripheral devices, you can obtain the proper shielded cable from your dealer. For non-Apple peripheral devices, contact the manufacturer or dealer for assistance.

If your computer does cause interference to radio or television reception, you can try to correct the interference by using one or more of the following measures:

- Turn the TV or radio antenna until the interference stops.
- Move the computer to one side or the other of the TV or radio.
- Move the computer farther away from the TV or radio.
- Plug the computer into an outlet that is on a different circuit than the TV or radio. (That is, make certain the computer and the radio or television set are on circuits controlled by different circuit breakers or fuses.)
- Consider installing a rooftop television antenna with coaxial cable lead-in between the antenna and TV.

If necessary, you should consult your dealer or an experienced radio/television technician for additional suggestions. You may find helpful the following booklet, prepared by the Federal Communications Commission:

"How to Identify and Resolve Radio-TV Interference Problems"

This booklet is available from the U.S. Government Printing Office, Washington, DC 20402, stock number 004-000-00345-4.

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Preface

Your Disk II is a valuable addition to your computer. Several individual files can be stored on a disk and each file can be accessed directly, by name. The Disk II also transfers data to your computer more rapidly than a tape recorder. In this manual you will learn how to unpack and install your Disk II.

Before attempting to use Disk II, read the manuals that come with your computer.

This manual contains four chapters. Chapter 1 introduces you to the drive and explains how to unpack it. Chapter 2 tells how to connect the drive to the Apple IIe. Chapter 3 tells how to connect the drive to the Apple II and Apple II Plus. You should refer only to the chapter that applies to your computer. Finally, Chapter 4 explains how to install the controller card in your computer.

To learn how to use your Disk II, refer to the Disk Operating System (DOS) Manual that comes with your drive.

Throughout this manual you will see two visual aids that are used to point out paragraphs of special interest.

Gray boxes contains especially useful or interesting information.

▲ **Warning**
boxes indicate potential problems or hazards.

Introduction

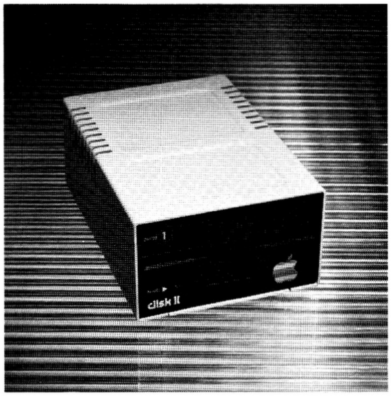
3 Getting Familiar
3 Unpacking Your Drive
4 How Do I Start?

IN USE
disk II

Introduction

Getting Familiar

Figure 1-1. Disk II



Your Disk II disk storage system consists of a disk drive in a compact cabinet (Figure 1-1), a controller card that you must install in your computer, and installation hardware.

Disk II's main advantage over a cassette based system is that information can be stored on or retrieved from the Disk II much more quickly and conveniently. Another important advantage of the Disk II is that information is stored and retrieved by a name under which it is filed.

The Disk II operates by performing three basic functions: positioning its read/write heads to a specified location on the disk, writing data, or reading data. However, it cannot do any of these things on its own. It must be directed by the controller card which you will later install in one of the computer's peripheral card slots. The controller interprets commands from the computer and causes the drive to perform its seek, read, and write functions.

Disk II is controlled by an operating system that automatically keeps track of files, saves and retrieves information, and does a multitude of other housekeeping tasks. The few special commands needed to manipulate files and use the drive are described in the reference manual for the particular programming language being used. For a complete understanding of your operating system refer to the Disk Operating System (DOS) Manual packed with your drive.

Unpacking Your Drive

Your Disk II is packed in a cardboard shipping carton. Among the items you will find in the carton is a packing list. Before going on, read over your packing list and then check each item as it is unpacked.

Carefully remove the disk drive so you do not damage it or the packing materials. Save the packing material in case you wish to transport your disk — or in the unlikely event you must return it to your dealer or to the factory for service.

How Do I Start?

You are now ready to remove the Apple's top cover to get access to the inside of the computer. Before you do however, notice that both Chapter 2 and 3 describe installation. This is because the procedure for installing your Disk II will differ slightly, depending on whether your computer is an Apple IIe or an Apple II. If you have an Apple IIe, refer to Chapter 2 for specific instructions on how to connect the drive to your computer. If your computer is an Apple II or Apple II Plus, you will find appropriate installation instructions in Chapter 3. In either case, you should only be concerned with the chapter that pertains to your computer.

Chapter 2

Installation for Apple IIe

7 Preparing to Install Your Drive
8 Installing Clamps and Cables

apple //c

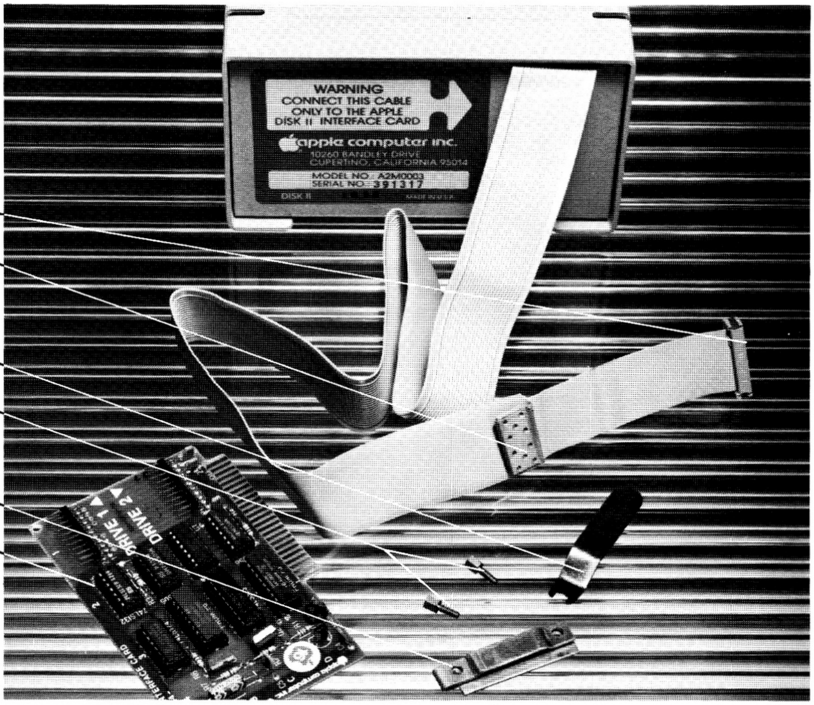
Installation for Apple IIe

Preparing to Install Your Drive

To install the Disk II on your Apple IIe, you'll need the items listed below and shown in Figure 2-1.

- Your Disk II drive(s), with their ribbon-like cable(s) fully extended
- Your disk controller card(s), unwrapped
- The "U" shaped metal clamp and two screws that come in a plastic bag in your disk drive package
- A small wrench

Figure 2-1. Things You'll Need for Installation on Apple IIe


WARNING
CONNECT THIS CABLE
ONLY TO THE APPLE
DISK II INTERFACE CARD
apple computer inc.
10260 BANDLEY DRIVE
CUPERTINO, CALIFORNIA 95014
MODEL NO. A2M0003
SERIAL NO. 391317
DISK II
DRIVE 1
DRIVE 2
Drive Cable Connector
Metal Flap
Small Wrench
Jack Screws
"U"-shaped Clamp
Controller Card

Installing Clamps and Cables

Before beginning, read over the entire procedure. You can cause permanent damage to your computer and your disk drive by not following these steps precisely.

1. Turn off the power switch on the back of your Apple IIe and any other attached peripheral devices. Disconnect the power plug.

Warning

If you try to connect anything to or disconnect anything from the inside of your computer when the power is on, you are likely to damage the circuits and lose any information stored in random access memory (RAM).

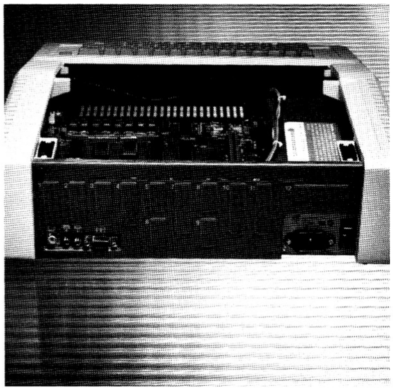
---

2. Reach behind the computer and pull up on the back corners of the cover until the corner fasteners pop apart. Carefully remove the cover and set it aside.
3. Look down into your computer and locate the power supply — the rectangular metal box along the left side of the computer. Touch the power supply case with one hand to discharge any static charge that may be on your clothes or body.

Note: As you are looking into your computer notice that the openings in the back panel are filled with cover plates.

4. Lean over the computer so that you can see the back panel (Figure 2-2). Notice that each cover plate has a number printed beside it.

Figure 2-2. Outside View of the Apple IIe Back Panel



You need only to concern yourself with the openings numbered 1 through 4. Remove the cover plate from a numbered opening for each of your drives, starting with opening #1.

Note: Remove the cover plates by reaching inside the computer and pushing down and out on the plastic tab on the top of each cover plate.

5. Now look at your disk drive's ribbon-like cable (Figure 2-1). It has a connector at its end and a metal flap on its side. Slide the connector through the lowest numbered opening available on the back panel to the inside of your computer.
6. Find the "U" shaped clamp and two Jack screws (Figure 2-1) that came packed with your drive. (Ignore the rectangular clamp and screw; this clamp was designed for installation on the Apple II or Apple II Plus and you do not need it.)

7. Take hold of the cable and bend the flap away from the connector. Hold the flap down against the cable with your thumb as shown in Figure 2-3.

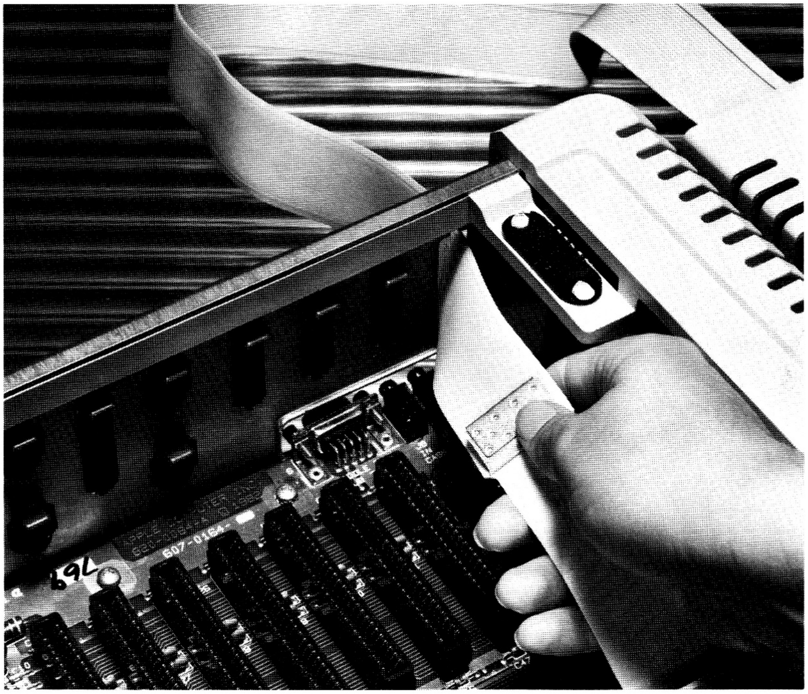


Figure 2-3. Grasp the cable

8. Hold the "U" shaped clamp in your other hand so that the raised "bump" on one side of the clamp is under your thumb and the opening in the clamp is pointing up (Figure 2-4).

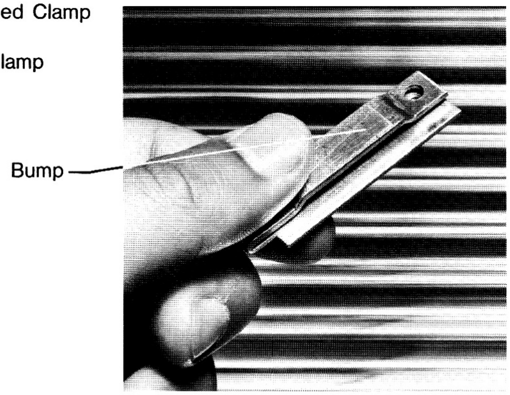


Figure 2-4 (Left). Hold U-shaped Clamp

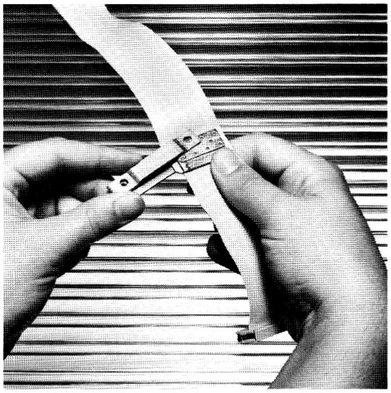


Figure 2-5 (Right). Place the Clamp Over the Metal Flap

9. Slide the cable and folded-over metal flap into the clamp so that the flap is pressed against the cable and sandwiched between the two sides of the clamp. (You may have to spread the clamp open slightly to make room for the flap.) See Figure 2-5.

10. Using Figure 2-6 as a guide, feed the cable back through the opening until the clamp touches the back panel. Push the clamp against the back panel so that the bump fills the opening and the two round nuts affixed to the clamp are facing you.

Note: In order to arrange the clamp so it's flat against the back panel, you have to bend the cable in an "L" shape at the drive side of the clamp.

Figure 2-6. Position the Clamp Over the Opening

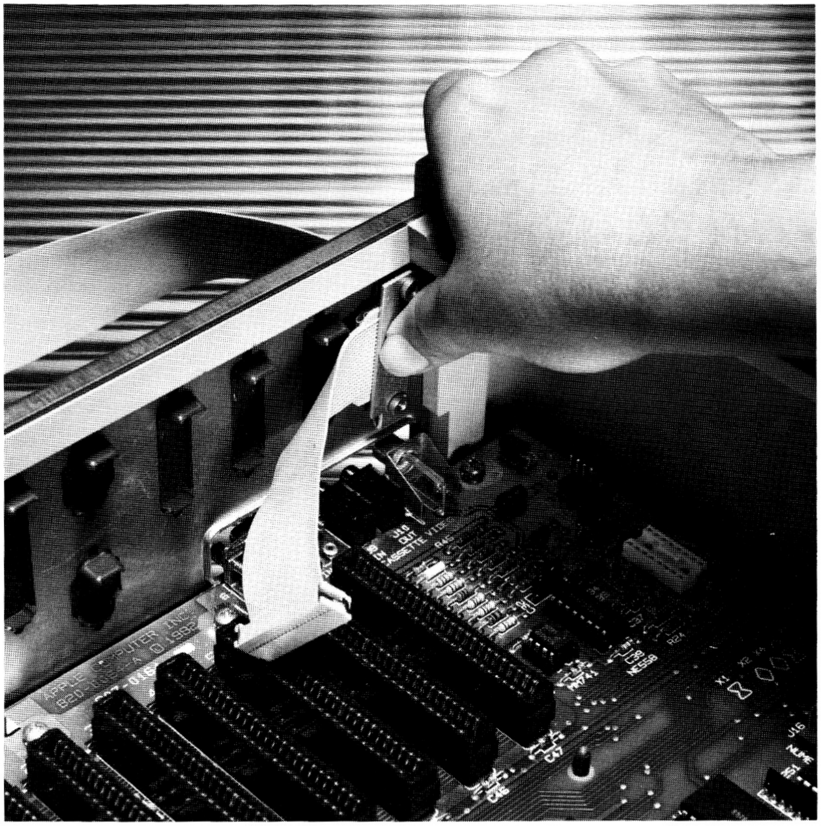
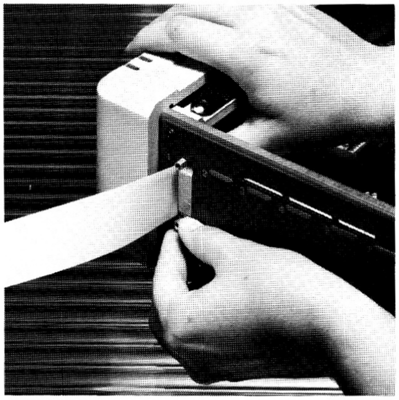


Figure 2-7. Install screws



11. Hold the clamp against the opening with one hand as shown in Figure 2-6. Reach behind the computer with the other hand and install screws through the two slots on the top and bottom of the opening into the nuts on the clamp (Figure 2-7). Use your small wrench to tighten the screws.

12. Repeat steps 5 through 11 for each additional Disk II you are connecting to your computer.

Continue with the installation of your Disk II storage system by installing the controller card as explained in Chapter 4.

Installation for Apple II and Apple II Plus

13 Preparing to Install Your Drive
14 Installing Clamps and Cables
15   For 2 Drives
15   For 4 Drives
16   Note for 3 Drives

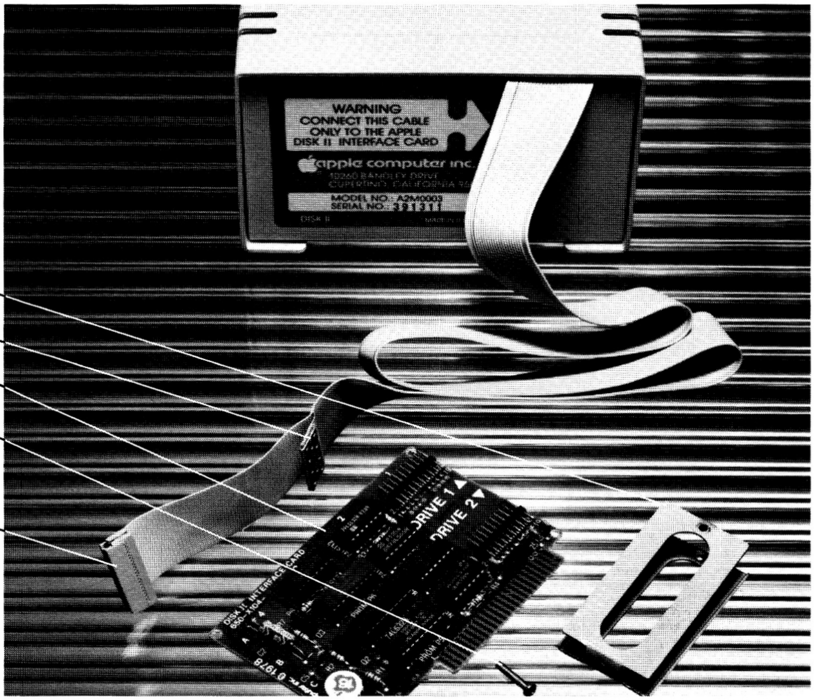
Installation for Apple II and Apple II Plus

Preparing to Install Your Drive

To install the Disk II on your computer, you'll need the items listed below and shown in Figure 3-1.

- Your Disk II drive(s), with their ribbon-like cable(s) fully extended
- Your disk controller card(s), unwrapped
- The rectangular metal clamp and the screw that come in a plastic bag in your disk drive package
- A Phillips screw driver

Figure 3-1. Things You'll Need for Installation on Apple II and Apple II Plus


Rectangular Metal Clamp
Metal Flap
Controller Card
Screw
Drive Cable Connector

Before beginning, read over the entire procedure. You can cause permanent damage to your computer and your disk drive by not following these steps precisely.

Installing Clamps and Cables

1. Turn off the power switch on the back of your computer and any other attached peripheral devices. Disconnect the power plug.

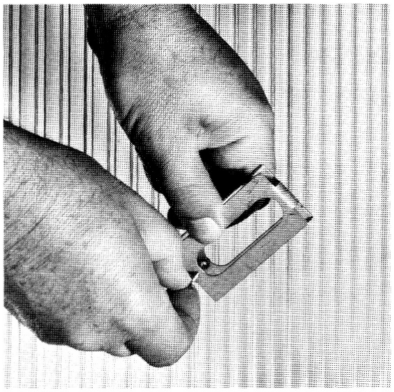
▲ **Warning**

If you try to connect anything to or disconnect anything from the inside of your computer when the power is on, you are likely to damage the circuits and lose any information stored in random access memory (RAM).

---

2. Reach behind the computer and pull up on the back corners of the cover until the corner fasteners pop apart. Carefully remove the cover and set it aside.
3. Look down into your computer and locate the power supply — the rectangular metal box along the left side of the computer. Touch the power supply case with one hand to discharge any static charge that may be on your clothes or body.
4. Remove the clamp and screw (Figure 3-1) from their plastic bag. (Ignore the "U" shaped clamp and two Jack screws; this clamp was designed for installation on the Apple IIe and you do not need it.) Note that a small round nut is affixed to one side of the clamp, centered over holes in the clamp. With one hand, squeeze together the sides of the clamp. With the other hand, slide the screw into the hole in the side of the clamp farthest from the nut as shown in Figure 3-2. Slide the screw through to the side of the clamp with the nut. Then give the screw a few turns until its end is flush with the nut.

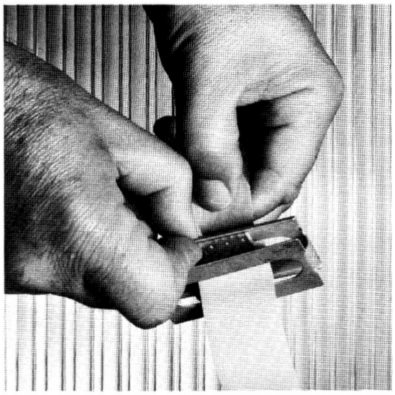
Figure 3-2. Prepare the Clamp



5. Slide your disk drive's cable connector through the opening in the metal clamp. Make sure the screw head on the metal clamp faces the disk drive.

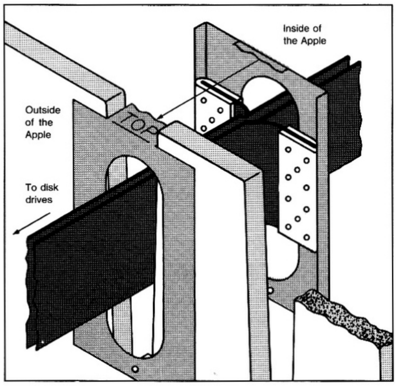
   Pull the cable through the clamp until the cable's metal flap fits between the two sides of the clamp as shown in Figure 3-3. (The metal flap should fit snugly into the curl formed by the long outer edges of the clamp.)

Figure 3-3. Position the Cable in the Clamp



For 2 Drives

Figure 3-4. Position Two Cables in the Clamp

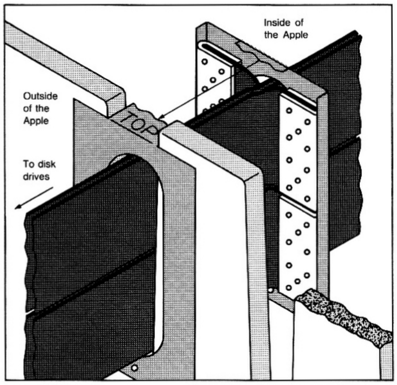


One at a time, slide the drive cable connectors through the long, oval opening in the metal clamp, making sure the cable flaps are facing outward and in *opposite* directions. Then pull the cables through until their flaps are between the two sides of the clamp. Position the flaps so that they fit into the clamp's curled edges, as shown in Figure 3-4. This illustration shows a cut-away view of the clamp as viewed from the back of the computer.

Helpful Hint: This may take some wiggling of the cables and even some pushing around of the flaps with your fingers. If so, please wiggle and push CAREFULLY!

For 4 Drives

Figure 3-5. Position Four Cables in the Clamp



One at a time, slide the drive cable connectors through the long, oval opening in the metal clamp, making sure that the flaps of two cables face out towards one outer edge of the clamp and that the other two cables' flaps face out towards the other outer edge of the clamp. Then pull the cables through until all their flaps are between the two sides of the clamp. Next separate the four cables into two pairs by sliding two cables down in the oval opening towards the screw and sliding the other two cables up towards the end of the clamp labeled TOP. Make sure each of these pairs has its two flaps facing in opposite directions. Move the flaps into the positions shown in Figure 3-5.

Note for 3 Drives

If you're installing 3 disk drives, follow the procedure described for 4 drives above as closely as possible. Where the instructions tell you to separate the cables into two pairs, slide one of the cables down towards the screw and the other two up toward the TOP label (flaps facing opposite directions). Have the flap of the third, unpaired cable (that you slid down towards the screw) facing outward and towards slot #7 and make sure it's correctly positioned under the curled edge. Use Figure 3-5 for your guide in positioning the flaps, imagining the lower, right-hand flap in that figure absent.

6. Locate the three deep, vertical notches in the back of the computer's case. In this step, you'll slide the clamp down over the third deep notch from the left (as seen from the keyboard side of the computer).

   Hold the cables and clamp in the arrangement described in step 5 for the number of drives you're installing. Being careful not to scratch the paint inside the computer case, slide the clamp down over the third notch from the left, making sure that:

- The side of the clamp with the screw head visible is OUTSIDE the computer
- The screw goes down into the notch first so that the clamp's label TOP is facing up
- The drive cable's metal flaps are INSIDE the computer, held flat against the inside of the case in the positions described above and not sticking out from under the curled edges of the clamp
- The metal flaps fit snugly under the curled edges of the clamp, and do not overlap one another

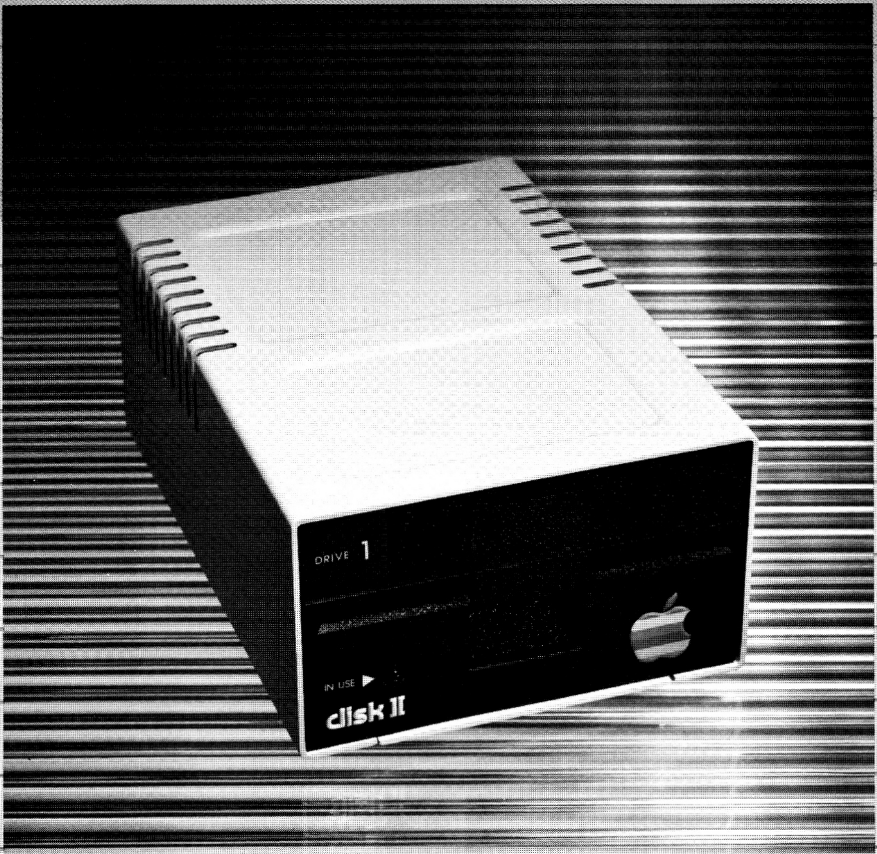
7. Gently push the clamp as far down into the notch as it will go. Tighten the clamp screw from the outside of the computer, making sure the flaps of the disk cables are held TIGHTLY against the inside of the computer's case by the metal clamp. As you do this check to make sure that all the conditions listed in step 6 are met.

   Continue with the installation of your Disk II storage system by installing the controller card as explained in Chapter 4.

Chapter 4

Installation of the Disk II Controller Card

19 Installing the Controller Card
19 For 2 Drives
20 For 3 or 4 Drives


DRIVE 1
IN USE ▶
disk II

Installation of The Disk II Controller Card

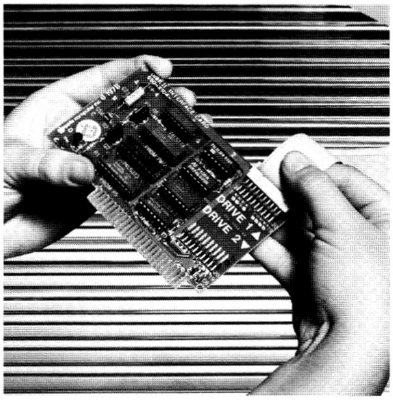
Installing the Controller Card

1. Hold the cable from the first drive (called DRIVE 1) and line up the holes in its connector with the "DRIVE 1" pins on the controller card.

Warning

Handle your controller card with care. Grasp it by the corners or edges, and try not to touch the components. Above all, don't grasp the card by the gold "fingers" on its bottom edge — they are the medium through which the computer communicates to the card and their efficiency decreases if they are dirty or scratched.

Figure 4-1. Connect DRIVE 1 to the Controller Card

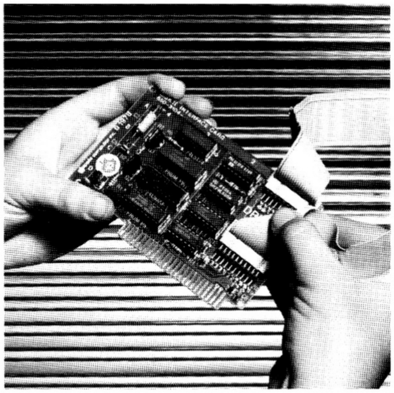


2. Plug the connector onto the pins as shown in Figure 4-1. Make sure that the pins line up with the matching holes in the connector, that there are no pins or holes left over on either end and that the cable exits the connector away from the controller card.

For 2 Drives

Following the instructions in step 1 and 2, above, plug the cable from your next drive (DRIVE 2) onto the "DRIVE 2" pins on the controller card as shown in Figure 4-2.

Figure 4-2. Connect DRIVE 2 to the Controller Card

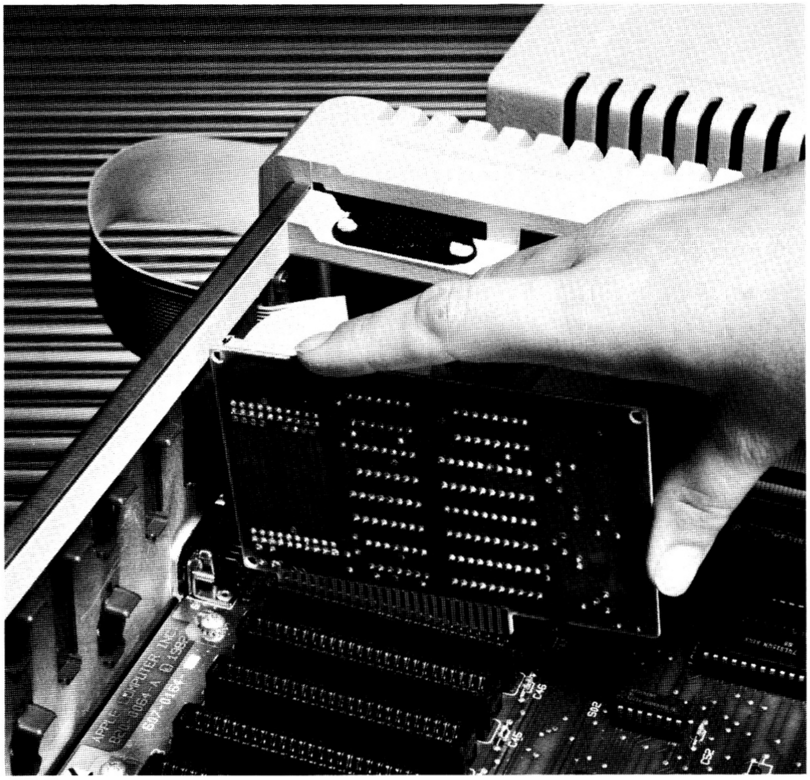


For 3 or 4 Drives

Using a second controller card, follow the instructions above but connect the cables from your third and forth drives to the "DRIVE 1" and "DRIVE 2" pins, respectively.

3. Locate the peripheral card connectors (usually referred to as slots) across the rear of your computer's main circuit board. Each slot is identified by a number on the circuit board. Slot #6, the second slot from the right, is reserved for your first Disk II controller card.
4. Pick up your controller card and position it over slot #6 so that the cable connections are toward the back of your computer.
5. Gently but firmly push the gold "fingers" on the cards edge connector into the slot, rear edge first as shown in figure 4-3. (You may have to exert pressure on the disk drive cables to bend them to get the controller card into position.) Then push the front edge down and gently rock the card back and forth until it is level and firmly seated. Finally, press down on each disk drive cable connector to make sure its plugged firmly into the controller card.

Figure 4-3. Install the Controller Card



For 3 or 4 Drives

First read and follow steps 1 and 2 above. Then locate slot #4, the fourth slot from the right. You'll use slot #4 for your second controller card, leaving slot #5 empty. Slide your second controller card (attached to the cables for drives 3 and 4) into slot #4. This may require some (gentle!) force to bend the cables to correctly position the card. After the card is in place, press down on each connector to make sure it's plugged firmly into the controller card. Press down once again on the card to ensure that it's firmly seated in the slot.

6. It's a good idea to label the front of each drive with the number that your programs will use to refer to it. Included in the package with your drive and controller is a small plastic bag containing two drive labels for DRIVE 1 and DRIVE 2. Use these labels to identify your drives. For example, label the drive connected to the DRIVE 1 pins of the card in slot #6 as "Drive 1". Refer to the following table and label any additional drives with the appropriate numbers.

Disk Drive Computer Connection	**Drive**
Slot 6, Drive 1	1
Slot 6, Drive 2	2
Slot 4, Drive 1	1
Slot 4, Drive 2	2

Note: You may want to pencil in the slot numbers on the drive labels if you have more then two drives.

7. Replace the cover on your computer by first sliding the front edge toward the keyboard and then pressing down on the two rear corners until they pop into place.

   If you are satisfied that you have correctly installed the Disk II on your computer, you are ready to go to the DOS Manual to learn how to use your new system.

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